

## Julie D. Jastrow

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### Education:

Ph.D. 1994 University of Illinois at Chicago (Biological Sciences)  
M.S. 1979 University of Illinois, Urbana-Champaign (Agronomy)  
B.S. 1973 University of Illinois, Urbana-Champaign (Agricultural Science, Option in Conservation and Environmental Biology; Highest Honors)

### Professional Experience:

2014-present Senior Fellow, Northwestern-Argonne Institute for Science and Engineering  
2013-present Group Leader, Argonne National Laboratory  
2010-present Senior Terrestrial Ecologist, Argonne National Laboratory  
2003-present Adjunct Faculty, Department of Geography, Northern Illinois University  
1995-2010 Terrestrial Ecologist, Argonne National Laboratory  
1984-1995 Environmental Scientist, Argonne National Laboratory  
1979-1984 Assistant Environmental Scientist, Argonne National Laboratory  
1975-1979 Scientific Assistant, Argonne National Laboratory  
1973-1975 Research Assistant, Agronomy Department, University of Illinois Urbana-Champaign

### Research Interests:

Plant-microbe-soil interactions; soil carbon and nutrient dynamics; distribution and quality of carbon stocks in permafrost-region soils; soil aggregate formation and stabilization; feedbacks between soil structure, organic matter, and biota; impacts of rising atmospheric CO<sub>2</sub> and climatic change on soils; soil carbon sequestration; soil biogeochemistry; sustainable bioenergy production; restoration ecology.

### Professional Affiliations:

American Geophysical Union, Botanical Society of America, Ecological Society of America, International Union of Soil Sciences, Soil Ecology Society, Soil Science Society of America.

### Professional Activities:

Subject Editor, *Soil Biology and Biochemistry*, 2013-present.  
Breakout Group Leader, U.S. DOE Workshop “Research for Sustainable Bioenergy”, 2013.  
Discussion Leader, U.S. DOE Workshop “Scaling Root Processes: Global Impacts”, 2012.  
Member, U.S. DOE Office of Biological and Environmental Research, Climate and Environmental Sciences Division, Terrestrial Ecosystem Science Proposal Review Panel, 2012.  
Member, Vulnerability of Permafrost Carbon Research Coordination Network, 2011-present.  
Member, U.S. DOE Office of Biological and Environmental Research, Early Career Research Program, Climate and Environmental Sciences Division, Terrestrial Proposal Review Panel, 2009.  
Co-organizer, Session on “Toward Large-Scale Assessments of Soil Carbon Turnover and Vulnerability: Measures, Models, and Networks”, American Geophysical Union Fall Meeting, 2008.  
Member, International Soil Carbon Network Scientific Steering Group, 2008-present.

Participant, U.S. DOE Workshop “Exploring Science Needs for the Next Generation of Climatic Change and Elevated CO<sub>2</sub> Experiments in Terrestrial Ecosystems”, 2008.

Member, Northeastern Regional Center of the U.S. DOE National Institute for Climatic Change Research Proposal Review Panel, 2007.

Member, Joint American Society of Agronomy, Crop Science Society of America, Soil Science Society of America Location of Meetings Committee, 2006-2009.

Member, National Academy of Sciences Frontiers in Soil Science Research Workshop Steering Committee, 2005-2009.

President, Soil Ecology Society, 2004-2005.

Participant and Discussion Leader (Cultivated Systems Disciplinary Session), North American Carbon Program Interdisciplinary Workshop, Des Moines, Iowa, 2004.

Invited Participant, U.S. Climate Change Science Program (CCSP) Ecosystems Interagency Workshop Silver Spring, Maryland, 2004.

Member, Advisory Committee for U.S. DOE-EPSCoR University of Nebraska Carbon Sequestration Program, 2003.

Member, U.S. DOE Global Change Education Program Selection Panel, 2003-2004; 2010.

Chief Scientist (one of three), U.S. DOE Consortium for Enhancing Carbon Sequestration in Terrestrial Ecosystems (CSiTE), 2002-2009.

President-Elect, Soil Ecology Society, 2002-2003.

Member, National Technical Advisory Committee, U.S. DOE National Institute for Global Environmental Change, 2000-2003.

Participant, U.S. USDA/ARS Global Change National Program Workshop, Denver, Colorado, 1999.

Chair, Nominations Committee, Soil Ecology Society, 1999.

Panelist, “Having a Science Career and Having a Life” for Symposium on Science Careers in Search of Women, Argonne National Laboratory, 1999.

Consulting Editor, *Plant and Soil*, Kluwer Academic Publishers, 1998-2003.

Member, Local Organizing Committee, Soil Ecology Society International Conference, 1998-1999.

Co-organizer, Symposium on “Carbon Sequestration by Soils” for the Annual Meeting of the Soil Science Society of America, 1998.

Member, Program Review Committee for U.S. USDA/ARS National Soil Tilth Laboratory, 1998.

Member, Soil and Vegetation Focus Group, U.S. DOE Carbon Sequestration Road Map Initiative, 1998.

Consultant, The Field Museum of Natural History “Underground Adventure” Exhibit, 1997-1998.

Member, Joint Interagency (NSF, DOE, USDA, NASA, EPA) Special Competition on Terrestrial Ecology and Global Change Proposal Review Panel, 1997.

Member, Student Awards Committee, Soil Ecology Society, 1995.

Member, Fermilab Ecological Land Management Committee, 1995-present.

Member, Director’s Review Committee for Individual Investigator Laboratory Directed Research and Development Program at Argonne National Laboratory, 1994-1996.

Mentor, NSF-sponsored Research Immersion Project for junior high school teachers, Argonne National Laboratory, 1994.

Laboratory Tour Presenter, Symposium on Science Careers in Search of Women, Argonne National Laboratory, 1993-1997; 2010-2012.

Member, Panel on Standards for Prairie Restoration, Society for Ecological Restoration, 1990.

Member, Fermilab Prairie Committee, 1985-1995.

### **Workshops Organized:**

Data Needs for Improving Model Representations of Soil Carbon Responses to Climate Change in Permafrost Regions, Argonne National Laboratory. 3-4 October 2011.

Characterizing Soil Carbon in Permafrost Regions and Its Vulnerability to Climate Change, Argonne National Laboratory, 14-15 February 2011.

### Honors/Awards:

Ottawa Township High School, Ottawa, Illinois, Hall of Fame, 2015.  
 UChicago Argonne, LLC Board of Governors Distinguished Performance Award, 2014.  
 Francis E. Clark Distinguished Lectureship on Soil Biology, Soil Science Society of America, 2010.  
 Outstanding Mentor, U.S. Department of Energy, Office of Science, Pre-Service Teachers Program, 2009  
 Outstanding Mentor, U.S. Department of Energy, Office of Science, Undergraduate Research Programs, 2003  
 Jessie E. Hackett Fellowship in Agronomy, University of Illinois Urbana-Champaign, 1974-75  
 Bronze Tablet (Highest Honors), Phi Kappa Phi, Mortar Board, Alpha Zeta & Gamma Sigma Delta (Agriculture Honoraries), University 100 Club (Activities Recognition), A.A. Harding Award (University Bands), University of Illinois Urbana-Champaign, 1973  
 James Scholar, University of Illinois Urbana-Champaign, 1969-73

### Refereed Publications:

1. Ping, C.L., J.D. Jastrow, M.T. Jorgenson, G.J. Michaelson, and Y.L. Shur. 2015. Permafrost soils and carbon cycling. *SOIL* 1:147-171.
2. Cheng, W., W.J. Parton, M.A. Gonzalez-Meler, R. Phillips, S. Asao, G.G. McNickle, E. Brzostek, and J.D. Jastrow. 2014. Synthesis and modeling perspectives of rhizosphere priming. *New Phytologist* 201:31-44.
3. de Graaff, M.-A., J.D. Jastrow, S. Gillette, A. Johns, and S.D. Wulfschleger. 2014. Differential priming of soil carbon driven by soil depth and root impacts on carbon availability. *Soil Biology and Biochemistry* 69:147-156.
4. Sánchez-de León, Y., J. Lugo-Pérez, D.H. Wise, J.D. Jastrow, and M.A. Gonzalez-Meler. 2014. Aggregate formation and carbon sequestration by earthworms in soil from a temperate forest exposed to elevated atmospheric CO<sub>2</sub>: A microcosm experiment. *Soil Biology and Biochemistry* 68:223-230.
5. de Graaff, M.-A., J. Six, J.D. Jastrow, C.W. Schadt, and S.D. Wulfschleger. 2013. Variation in root architecture among switchgrass cultivars impacts root decomposition rates. *Soil Biology and Biochemistry* 58:198-206.
6. Fan, Z., J.D. Jastrow, C. Liang, R. Matamala, and R.M. Miller. 2013. Priming effects in boreal black spruce forest soils: quantitative evaluation and sensitivity analysis. *PLoS ONE* 8:e77880.
7. Koch, A., A. McBratney, M. Adams, D. Field, R. Hill, J. Crawford, B. Minasny, R. Lal, L. Abbott, A. O'Donnell, D. Angers, J. Baldock, E. Barbier, D. Binkley, W. Parton, D.H. Wall, M. Bird, J. Bouma, C. Chenu, C.B. Flora, K. Goulding, S. Gunwald, J. Hempel, J. Jastrow, J. Lehmann, K. Lorenz, C.L. Morgan, C.W. Rice, D. Whitehead, I. Young, and M. Zimmermann. 2013. Soil security: Solving the global soil crisis. *Global Policy* 4:434-441.
8. Mishra, U., J.D. Jastrow, R. Matamala, G. Hugelius, C.D. Koven, J.W. Harden, C.L. Ping, G.J. Michaelson, Z. Fan, R.M. Miller, A.D. McGuire, C. Tarnocai, P. Kuhry, W.J. Riley, K. Schaefer, E.A.G. Schuur, M.T. Jorgenson, and L.D. Hinzman. 2013. Empirical estimates to reduce modeling uncertainties of soil organic carbon in permafrost regions: a review of recent progress and remaining challenges. *Environmental Research Letters* 8:035020.
9. O'Brien, S.L., and J.D. Jastrow. 2013. Physical and chemical protection in hierarchical soil aggregates regulates soil carbon and nitrogen recovery in restored perennial grasslands. *Soil Biology and Biochemistry* 61:1-13.
10. O'Brien, S.L., J.D. Jastrow, K.J. McFarlane, T.P. Guilderson, and M.A. Gonzalez-Meler. 2013. Decadal cycling within long-lived carbon pools revealed by dual isotopic analysis of mineral-associated soil organic matter. *Biogeochemistry* 112:111-125 with Erratum DOI 10.1007/s10533-012-9745-9.

11. Schuur, E.A.G., B.W. Abbott, W.B. Bowden, V. Brovkin, P. Camill, J.G. Canadell, J.P. Chanton, F.S. Chapin III, T.R. Christensen, P. Ciais, B.T. Crosby, C.I. Czimczik, G. Grosse, J. Harden, D.J. Hayes, G. Hugelius, J.D. Jastrow, J.B. Jones, T. Kleinen, C.D. Koven, G. Krinner, P. Kuhry, D.M. Lawrence, A.D. McGuire, S.M. Natali, J.A. O'Donnell, C.L. Ping, W.J. Riley, A. Rinke, V.E. Romanovsky, A.B.K. Sannel, C. Schädel, K. Schaefer, J. Sky, Z.M. Subin, C. Tarnocai, M. Turetsky, M. Waldrop, K.M. Walter-Anthony, K.P. Wickland, C.J. Wilson, and S.A. Zimov. 2013. Expert assessment of vulnerability of permafrost carbon to climate change. *Climatic Change* 119:359-374.
12. Stockmann, U., M.A. Adams, J.W. Crawford, D.J. Field, N. Henakaarchchi, M. Jenkins, B. Minasny, A.B. McBratney, V. de Remy de Courcelles, K. Singh, I. Wheeler, L. Abbott, D. Angers, J. Baldock, M. Bird, P.C. Brookes, C. Chenu, J.D. Jastrow, R. Lal, J. Lehmann, A.G. O'Donnell, W.J. Parton, D. Whitehead, and M. Zimmermann. 2013. The knowns, known unknowns and unknowns of sequestration of soil organic carbon. *Agriculture, Ecosystems and Environment* 164:80-99.
13. Watrud, L.S., J.R. Reichman, M.A. Bollman, B.M. Smith, E.H. Lee, J.D. Jastrow, M.D. Casler, H.P. Collins, S. Fransen, R.B. Mitchell, V.N. Owens, B. Bean, W.L. Rooney, D.D. Tyler, and G.A. King. 2013. Chemistry and microbial functional diversity differences in biofuel crop and grassland soils in multiple geographies. *BioEnergy Research* 6:601-619.
14. Mayer, L.M., K.R. Thornton, L.L. Schick, J.D. Jastrow, and J.W. Harden. 2012. Photodissolution of soil organic matter. *Geoderma* 170:314-321.
15. Schuur, E.A.G., B.W. Abbott, and the Permafrost Carbon Network (W.B. Bowden, V. Brovkin, P. Camill, J.P. Canadell, F.S. Chapin III, T.R. Christensen, J.P. Chanton, P. Ciais, P.M. Crill, B.T. Crosby, C.I. Czimczik, G. Grosse, D.J. Hayes, G. Hugelius, J.D. Jastrow, T. Kleinen, C.D. Koven, G. Krinner, P. Kuhry, D.M. Lawrence, S.M. Natali, C.L. Ping, A. Rinke, W.J. Riley, V.E. Romanovsky, A.B.K. Sannel, C. Schädel, K. Schaefer, Z.M. Subin, C. Tarnocai, M. Turetsky, K. M. Walter-Anthony, C.J. Wilson, and S.A. Zimov). 2011. High risk of permafrost thaw. *Nature* 480:32-33.
16. Garten, Jr., C.T., D.J. Brice, H.F. Castro, R.L. Graham, M.A. Mayes, J.R. Phillips, W.M. Post III, C.W. Schadt, S.D. Wullschleger, D.D. Tyler, P.M. Jardine, J.D. Jastrow, R. Matamala, R.M. Miller, K.K. Moran, T.W. Vugteveen, R.C. Izaurralde, A.M. Thomson, T.O. West, J.E. Amonette, V.L. Bailey, F.B. Metting, and J.L. Smith. 2011. Response of "Alamo" switchgrass tissue chemistry and biomass to nitrogen fertilization in West Tennessee, USA. *Agriculture Ecosystems and Environment* 140:289-297.
17. Hofmockel, K.S., D.R. Zak, K.K. Moran, and J.D. Jastrow. 2011. Changes in forest soil organic matter pools after a decade of elevated CO<sub>2</sub> and O<sub>3</sub>. *Soil Biology and Biochemistry* 43:1518-1527.
18. Jung, J.Y., R. Lal, J.D. Jastrow, and D.D. Tyler. 2011. Nitrogenous fertilizer effects on soil structural properties under switchgrass. *Agriculture Ecosystems and Environment* 141:215-220.
19. Garten Jr., C.T., J.L. Smith, D.D. Tyler, J.E. Amonette, V.L. Bailey, D.J. Brice, H.F. Castro, R.L. Graham, C.A. Gunderson, R.C. Izaurralde, P.M. Jardine, J.D. Jastrow, M.K. Kerley, R. Matamala, M.A. Mayes, F.B. Metting, R.M. Miller, K.K. Moran, W.M. Post III, R.D. Sands, C.W. Schadt, J.R. Phillips, A.M. Thomson, T. Vugteveen, T.O. West, and S.D. Wullschleger. 2010. Intra-annual changes in biomass, carbon, and nitrogen dynamics at 4-year old switchgrass field trials in west Tennessee, USA. *Agriculture, Ecosystems and Environment* 136:177-184.
20. Moran, K.K., and J.D. Jastrow. 2010. Elevated carbon dioxide does not offset loss of soil carbon from a corn-soybean agroecosystem. *Environmental Pollution* 158:1088-1094.
21. O'Brien, S.L., J.D. Jastrow, D.A. Grimley, and M.A. Gonzalez-Meler. 2010. Moisture and vegetation controls on decadal-scale accrual of soil organic carbon and total nitrogen in restored grasslands. *Global Change Biology* 16:2573-2588.

22. Hungate, B.A., K.-J. van Groenigen, J. Six, J.D. Jastrow, Y.Q. Luo, M.-A. de Graaff, C. van Kessel, and C.W. Osenberg. 2009. Assessing the effect of elevated carbon dioxide on soil carbon: a comparison of four meta-analyses. *Global Change Biology* 15:2020-2034.
23. Post W.M., J.E. Amonette, R. Birdsey, C.T. Garten Jr., R.C. Izaurralde, P.M. Jardine, J. Jastrow, R. Lal, G. Marland, B.A. McCarl, A.M. Thomson, T.O. West, S.D. Wullschleger, and F.B. Metting. 2009. Terrestrial biological carbon sequestration: Science for enhancement and implementation, pp. 73-88. In B.J. McPherson and E.T. Sundquist (Eds.) *Carbon Sequestration and Its Role in the Global Carbon Cycle*. Geophysical Monograph Series 183, American Geophysical Union, Washington, DC.
24. Filley, T.R., T.W. Boutton, J.D. Liao, J.D. Jastrow, and D.E. Gamblin. 2008. Chemical changes to nonaggregated particulate soil organic matter following grassland-to-woodland transition in a subtropical savanna. *Journal of Geophysical Research—Biogeosciences* 113:G03009.
25. Fitzsimons, M.S., R.M. Miller, and J.D. Jastrow. 2008. Scale-dependent niche axes of arbuscular mycorrhizal fungi. *Oecologia* 158:117-127.
26. Matamala, R., J.D. Jastrow, R.M. Miller, and C.T. Garten. 2008. Temporal changes in C and N stocks of restored prairie: Implications for C sequestration strategies. *Ecological Applications* 18:1470-1488.
27. McCarthy, J.F., J. Ilavsky, J.D. Jastrow, L.M. Mayer, E. Perfect, and J. Zhuang. 2008. Protection of organic carbon in soil microaggregates via restructuring of aggregate porosity and filling of pores with accumulating organic matter. *Geochimica et Cosmochimica Acta* 72:4725-4744.
28. Zhuang, J., J.F. McCarthy, E. Perfect, L.M. Mayer, and J.D. Jastrow. 2008. Soil water hysteresis in water-stable microaggregates as affected by organic matter. *Soil Science Society of America Journal* 72:212-220.
29. Allison, V.J., Z. Yermakov, R.M. Miller, J.D. Jastrow, and R. Matamala. 2007. Assessing soil microbial community composition across landscapes: Do surface soils reveal patterns? *Soil Science Society of America Journal* 71:730-734.
30. Allison, V.J., Z. Yermakov, R.M. Miller, J.D. Jastrow, and R. Matamala. 2007. Using landscape and depth gradients to decouple the impact of correlated environmental variables on soil microbial community composition. *Soil Biology and Biochemistry* 39:505-516.
31. Jastrow, J.D., J.E. Amonette, and V.L. Bailey. 2007. Mechanisms controlling soil carbon turnover and their potential application for enhancing carbon sequestration. *Climatic Change* 80:5-23.
32. Allison, S.D., and J.D. Jastrow. 2006. Activities of extracellular enzymes in physically isolated fractions of restored grassland soils. *Soil Biology and Biochemistry* 38:3245-3256.
33. Liao, J.D., T.W. Boutton, and J.D. Jastrow. 2006. Storage and dynamics of carbon and nitrogen in soil physical fractions following woody plant invasion of grassland. *Soil Biology and Biochemistry* 38:3184-3196.
34. Liao, J.D., T.W. Boutton, and J.D. Jastrow. 2006. Organic matter turnover in soil physical fractions following woody plant invasion of grassland: Evidence from natural  $^{13}\text{C}$  and  $^{15}\text{N}$ . *Soil Biology and Biochemistry* 38:3197-3210.
35. Norby, R.J., S.D. Wullschleger, P.J. Hanson, C.A. Gunderson, T.J. Tschaplinski, and J.D. Jastrow. 2006.  $\text{CO}_2$  enrichment of a deciduous forest: The Oak Ridge FACE experiment, pp. 231-251. In J. Nösberger, S.P. Long, R.J. Norby, M. Stitt, G.R. Hendrey, and H. Blum (eds.) *Managed Ecosystems and  $\text{CO}_2$  Case Studies, Processes, and Perspectives*. Ecological Studies, Vol. 187, Springer-Verlag, Berlin.
36. Allison, V.J., R.M. Miller, J.D. Jastrow, R. Matamala, and D.R. Zak. 2005. Changes in soil microbial community structure in a tallgrass prairie chronosequence. *Soil Science Society of America Journal* 69:1412-1421.

37. Jastrow, J.D., R.M. Miller, R. Matamala, R.J. Norby, T.W. Boutton, C.W. Rice, and C.E. Owensby. 2005. Elevated atmospheric CO<sub>2</sub> increases soil carbon. *Global Change Biology* 11:2057-2064.
38. Matamala, R., M.A. Gonzalez-Meler, J.D. Jastrow, R.J. Norby, and W.H. Schlesinger. 2004. Response to comment on "Impacts of fine root turnover on forest NPP and soil C sequestration potential". *Science* 304:1745.
39. Post, W.M., R.C. Izaurrealde, J.D. Jastrow, B.A. McCarl, J.E. Amonette, V.L. Bailey, P.M. Jardine, and J. Zhou. 2004. Enhancement of carbon sequestration in U.S. soils. *BioScience* 54:895-908.
40. Bever, J.D., P.A. Schultz, R.M. Miller, L. Gades, and J.D. Jastrow. 2003. Inoculation with prairie mycorrhizal fungi may improve restoration of native prairie plant diversity. *Ecological Restoration* 21:311-312.
41. Matamala, R., M.A. Gonzalez-Meler, J.D. Jastrow, R.J. Norby, and W.H. Schlesinger. 2003. Impacts of fine root turnover on forest NPP and soil C sequestration potential. *Science* 302:1385-1387.
42. Miller, R.M., S.P. Miller, J.D. Jastrow, and C.B. Rivetta. 2002. Mycorrhizal mediated feedbacks influence net carbon gain and nutrient uptake in *Andropogon gerardii*. *New Phytologist* 155:149-162.
43. Six, J., and J.D. Jastrow. 2002. Organic matter turnover, pp.936-942. In R. Lal (ed.), *Encyclopedia of Soil Science*. Marcel Dekker, New York. (also published online at [www.dekker.com](http://www.dekker.com))
44. Schultz, P.A., R.M. Miller, C.B. Rivetta, J.D. Jastrow, and J.D. Bever. 2001. Evidence of a mycorrhizal mechanism for the adaptation of *Andropogon gerardii* to high and low-nutrient prairies. *American Journal of Botany* 88:1650-1656.
45. Jastrow, J.D., R.M. Miller, and C.E. Owensby. 2000. Long-term effects of elevated atmospheric CO<sub>2</sub> on below-ground biomass and transformations to soil organic matter in grassland. *Plant and Soil* 224:85-97.
46. Miller, R.M., and J.D. Jastrow. 2000. Mycorrhizal fungi influence soil structure, pp. 3-18. In Y. Kapulnik and D.D. Douds, Jr. (eds.), *Arbuscular Mycorrhizas: Physiology and Function*. Kluwer Academic Publishers, Dordrecht, The Netherlands.
47. Kemner, K.M., W. Yun, Z. Cai, B. Lai, H.-R. Lee, J. Maser, D.G. Legnini, W. Rodrigues, J.D. Jastrow, R.M. Miller, S.T. Pratt, M.A. Schneegurt, and C.F. Kolpa Jr. 1999. Using zone plates for X-ray microimaging and microspectroscopy in environmental science. *Journal of Synchrotron Radiation* 6:639-641.
48. Miller, R.M., C.I. Smith, J.D. Jastrow, and J.D. Bever. 1999. Mycorrhizal status of the genus *Carex* (Cyperaceae). *American Journal of Botany* 86:547-553.
49. Six, J., P.A. Schultz, J.D. Jastrow, and R. Merckx. 1999. Recycling of sodium polytungstate used in soil organic matter studies. *Soil Biology and Biochemistry* 31:1193-1196.
50. Jastrow, J.D., and R.M. Miller. 1998. Soil aggregate stabilization and carbon sequestration: Feedbacks through organomineral associations, pp. 207-223. In R. Lal, J.M. Kimble, R.F. Follett, and B.A. Stewart (eds.), *Soil Processes and the Carbon Cycle*. CRC Press LLC, Boca Raton, FL.
51. Jastrow, J.D., R.M. Miller, and J. Lussenhop. 1998. Contributions of interacting biological mechanisms to soil aggregate stabilization in restored prairie. *Soil Biology and Biochemistry* 30:905-916.
52. Jastrow, J.D. 1996. Soil aggregate formation and the accrual of particulate and mineral-associated organic matter. *Soil Biology and Biochemistry* 28:665-676.
53. Jastrow, J.D., T.W. Boutton, and R.M. Miller. 1996. Carbon dynamics of aggregate-associated organic matter estimated by carbon-13 natural abundance. *Soil Science Society of America Journal* 60:801-807.

54. McConnell, J.W., Jr., R.D. Rogers, T.M. Sullivan, J.D. Jastrow, D.S. Hicks, and R.R. Brey. 1996. Lysimeter data as input to performance assessment models, pp. 706-723. *In* T.M. Gilliam and C.C. Wiles (eds.), *Stabilization and Solidification of Hazardous, Radioactive, and Mixed Wastes, 3rd Volume, ASTM STP 1240*. American Society for Testing and Materials, West Conshohocken, Pennsylvania.
55. Miller, R.M., and J.D. Jastrow. 1996. Contributions of legumes to the formation and maintenance of soil structure. pp. 105-112. *In* D. Younie (ed.), *Legumes in Sustainable Farming Systems*. Occasional Symposium No. 30, British Grassland Society, Reading, UK.
56. Miller, R.M., D.R. Reinhardt, and J.D. Jastrow. 1995. External hyphal production of vesicular-arbuscular mycorrhizal fungi in pasture and tallgrass prairie communities. *Oecologia* 103:17-23.
57. Brey, R.R., J.W. McConnell, R.D. Rogers, T.M. Sullivan, and J.D. Jastrow. 1994. A preliminary investigation of the existence of radiocolloids in leachate from the NRC field lysimeter investigations. *Waste Management* 14:581-588.
58. Miller, R.M., and J.D. Jastrow. 1994. Vesicular-arbuscular mycorrhizae and biogeochemical cycling, pp. 189-212. *In* F.L. Pfleger and R.G. Linderman (eds.), *Mycorrhizae and Plant Health*. APS Press, The American Phytopathology Society, St. Paul, Minnesota.
59. Jastrow, J.D., and R.M. Miller. 1993. Neighbor influences on root morphology and mycorrhizal fungus colonization in tallgrass prairie plants. *Ecology* 74:561-569.
60. Rogers, R.D., J.W. McConnell, Jr., T.M. Sullivan, J.D. Jastrow, and D.S. Hicks. 1993. Field testing of waste forms using lysimeters: Results after seven years, pp. 459-465. *In* M. Arnould, M. Barrès, and B. Côme (eds.), *Geology and Confinement of Toxic Wastes*. A.A. Balkema, Rotterdam.
61. McConnell, J.W., Jr., R.D. Rogers, J.D. Jastrow, and D.S. Wickliff. 1992. Results of field testing of radioactive waste forms using lysimeters, pp. 1455-1462. *Proceedings of Spectrum '92: Nuclear and Hazardous Waste Management International Topical Meeting*, Boise, Idaho, 23-27 August 1992. American Nuclear Society.
62. Miller, R.M., and J.D. Jastrow. 1992. The application of va mycorrhizae to ecosystem restoration and reclamation, pp. 438-467. *In* M.F. Allen (ed.), *Mycorrhizal Functioning: An Integrative Plant-Fungal Process*. Chapman and Hall, New York.
63. Miller, R.M., and J.D. Jastrow. 1992. Extraradical hyphal development of vesicular-arbuscular mycorrhizal fungi in a chronosequence of prairie restorations, pp. 171-176. *In* D.J. Read, D.H. Lewis, A.H. Fitter, and I.J. Alexander (eds.), *Mycorrhizas in Ecosystems*. CAB International, Cambridge, United Kingdom.
64. Miller, R.M., and J.D. Jastrow. 1992. The role of mycorrhizal fungi in soil conservation, pp. 29-44. *In* G.J. Bethlenfalvay and R.G. Linderman (eds.), *Mycorrhizae in Sustainable Agriculture*. ASA Special Publication No. 54, American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, Madison, Wisconsin.
65. Rogers, R.D., J.W. McConnell, Jr., J.D. Jastrow, and D.S. Wickliff. 1992. Contributions of lysimeter data to the development of site specific performance assessment plans, pp. 448-465. *In* T.M. Gilliam and C.C. Wiles (eds.), *Stabilization and Solidification of Hazardous, Radioactive, and Mixed Wastes, 2nd Volume*. American Society for Testing and Materials, Philadelphia, Pennsylvania.
66. Jastrow, J.D., and R.M. Miller. 1991. Methods for assessing the effects of biota on soil structure. *Agriculture, Ecosystems and Environment* 34:279-303.
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68. Rogers, R.D., J.W. McConnell, Jr., J.D. Jastrow, and D.S. Wickliff. 1991. Results of field testing of waste forms using lysimeters, pp. 85-91. *Proceedings of the 1991 Joint International Waste Management Conference, Volume 1: Low and Intermediate Level Radioactive Waste Management*, Seoul, Korea, 21-26 October 1991. American Society of Mechanical Engineers.
69. Miller, R.M., and J.D. Jastrow. 1990. Hierarchy of root and mycorrhizal fungal interactions with soil aggregation. *Soil Biology and Biochemistry* 22:579-584.
70. Wesely, M.L., D.L. Sisterson, and J.D. Jastrow. 1990. Observations of the chemical properties of dew on vegetation that affect the dry deposition of SO<sub>2</sub>. *Journal of Geophysical Research* 95:7501-7514.
71. Cook, B.D., J.D. Jastrow, and R.M. Miller. 1988. Root and mycorrhizal endophyte development in a chronosequence of restored tallgrass prairie. *New Phytologist* 110:355-362.
72. Jastrow, J.D. 1987. Changes in soil aggregation associated with tallgrass prairie restoration. *American Journal of Botany* 74:1656-1664.
73. Jastrow, J.D., R.M. Miller, S.C. Rabatin, and R.R. Hinchman. 1984. Revegetation of disturbed lands in arid ecosystems, pp. 2-1 through 2-36. In A.J. Dvorak (ed.), *Ecological Studies of Disturbed Landscapes*. DOE/NBM-5009372, U.S. Department of Energy.
74. Jastrow, J.D., et al. 1984. Amelioration of acidic waste materials resulting from energy mineral extraction, pp. 4-1 through 4-67. In A.J. Dvorak (ed.), *Ecological Studies of Disturbed Landscapes*. DOE/NBM-5009372, U.S. Department of Energy.
75. Jastrow, J.D., C.A. Zimmerman, A.J. Dvorak, and R.R. Hinchman. 1981. Plant growth and trace-element uptake on acidic coal refuse amended with lime or fly ash. *Journal of Environmental Quality* 10:154-160.
76. Jastrow, J.D., and D.E. Koeppe. 1980. Uptake and effects of cadmium in higher plants, pp. 607-638. In J.O. Nriagu (ed.), *Cadmium in the Environment, Part I*. John Wiley and Sons, New York.

#### Invited Presentations and Seminars:

1. Jastrow, J.D. Soil carbon response to environmental change: Initial results of the Argonne Terrestrial Ecosystem Science SFA. DOE/BER/CESD Seminar, Germantown, MD. 26 June 2014.
2. Mishra U., J. Jastrow, R. Matamala, K. Lagory, and J. Krummel. Environmental controls and spatial representation of soil properties across Alaska: Comparison between geospatial and CMIP5 Earth system models. Korea Polar Research Institute Seminar, Seoul, South Korea. 16 June 2014.
3. Jastrow, J.D. Doing what comes naturally: What about terrestrial carbon sequestration? Northwestern University Fourth Annual Climate Change Symposium "The Future of Carbon", Evanston, Illinois. 16 May 2014.
4. Mishra U., J. Jastrow, R. Matamala, K. Lagory, and J. Krummel. Benchmarking Earth system models: A new domain for soil scientists. Natural Resource Conservation Service Seminar, Lincoln, NE. 18 Mar 2014.
5. Jastrow, J.D. Beyond physics: The (practically) 30-year Argonne-Fermilab ecology connection; Argonne's soil, bioenergy crops, and carbon cycle/sequestration research at Fermilab. Fermilab Ecological Land Management Committee Winter Speaker Series, Batavia, Illinois. 6 Feb 2014.
6. Jastrow, J.D. Linking aggregate-scale mechanisms and landscape-scale drivers to understand soil carbon dynamics. Soil Science Society of America International Annual Meeting, Tampa, Florida. 5 November 2013.
7. Jastrow, J.D. Soil complexity: It's a matter of scale. Workshop on Metaproteomics of the Soil: The Challenges and Possibilities, DOE Joint Genome Institute User Meeting. Walnut Creek, California. 25 March 2013.



8. Jastrow, J.D. Prairie restoration below ground: The time and space of carbon sequestration. Seminar Series, Department of Natural Resources and Environmental Sciences, University of Illinois, Urbana-Champaign, Illinois. 15 March 2013.
9. de Graaff, M.A., J.D. Jastrow, S.J. Gillette, A. Johns, and S.D. Wulfschleger. 2012. Differential priming of soil carbon driven by soil depth and root impacts on carbon lability. Fall Meeting, American Geophysical Union, San Francisco, CA. 4 December 2012.
10. O'Brien, S.L., S.M. Owens, J. Hampton-Marcell, J.D. Jastrow, E.R. Johnston, D.P. Smith, D.A. Antonopoulos, J.A. Gilbert, and F. Meyer. 2012. Spatial structure of soil microbial communities from centimeter to ecosystem. 4th Annual Argonne Soil Metagenomics Meeting, Bloomington, IL. 3 October 2012.
11. Jastrow, J.D. Prairie restoration below ground: Rebuilding our soil resource. Symposium on Tallgrass Prairie Restoration in the 21st Century, The Morton Arboretum, Lisle, Illinois. 13 September 2012.
12. Jastrow, J.D. The time and space of carbon sequestration in soils. DOE/BER/CESD Terrestrial Ecosystem Sciences PI Meeting, Washington, DC. 24 April 2012.
13. Jastrow, J.D. The science of soil carbon: Pools or particles. Soil Carbon Stakeholder Workshop, The United States Studies Centre, University of Sydney, Australia. 3 February 2011.
14. Jastrow, J.D. Is any fractionation of soil carbon arbitrary? Soil Carbon Summit, The United States Studies Centre and Faculty of Agriculture, Food and Natural Resources, University of Sydney, Australia. 1 February 2011.
15. Jastrow, J.D. Integrating soil structure and soil function: Tales of aggregates, pores, biota, and organic matter. Francis E. Clark Distinguished Lectureship on Soil Biology. ASA-CSSA-SSSA 2010 International Annual Meetings, Long Beach, California. 2 November 2010.
16. Jastrow, J.D., R. Matamala, S.L. O'Brien, and R.M. Miller. Carbon sequestration in terrestrial ecosystems. 41st China Ecological Forum Lecture sponsored by the National Ecosystem Observatory Network, Chinese Ecosystem Research Network, and Chinese Terrestrial Ecosystem Flux Research Network (ChinaFLUX) at the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing, China. 10 January 2010.
17. Jastrow, J.D. Aggregate hierarchy and the stabilization of root-derived organic matter. Keynote address at the China-U.S. Workshop on Sustainable Management of Soil and Water Resources, Institute of Applied Ecology, Chinese Academy of Sciences and Shenyang Agricultural University, Shenyang, China. 7 January 2010.
18. Iversen, C.M., J.D. Jastrow, and R.J. Norby. Transfer of carbon and nitrogen from decomposing roots into different soil organic matter fractions. Organized Oral Session on Missing Links in the Root-Soil Organic Matter Continuum. 94th Ecological Society of America Annual Meeting, Albuquerque, New Mexico. 3 August 2009.
19. Jastrow, J.D. Soil stabilization of root-derived organic matter: Aggregate formation and physical protection of root inputs. Organized Oral Session on Missing Links in the Root-Soil Organic Matter Continuum. 94th Ecological Society of America Annual Meeting, Albuquerque, New Mexico. 3 August 2009.
20. Metting, F.B., W.M. Post, J.E. Amonette, V.L. Bailey, C.T. Garten, R.L. Graham, R.C. Izaurralde, P.M. Jardine, J.D. Jastrow, R. Lal, G. Marland, B.A. McCarl, R. Sands, A.M. Thomson, D. Tyler, T.O. West, and S.D. Wulfschleger. Soil carbon sequestration – Science for enhancement and implementation. Session on Enhanced Carbon Sequestration in the Biosphere: New Science and Comprehensive Analyses, 2008 American Geophysical Union Fall Meeting, San Francisco, California. 16 December 2008.
21. Jastrow, J.D. Quantifying soil organic matter and structural interactions. Symposium on Microbial Controls over Soil Organic Matter Structure and Function. 2007 Annual Meeting of the Soil Science Society of America, New Orleans, Louisiana. 7 November 2007.

22. Jastrow, J.D. What is carbon sequestration? Kickoff Presentation for the Workshop on Global Warming Policy and Pennsylvania Agriculture, Clean Air Council, Norristown, Pennsylvania. 8 November 2006.
23. Jastrow, J.D. Prairie restoration below ground: Rebuilding soil structure and organic matter. W.K. Kellogg Biological Station Fall Seminar Series, Michigan State University, Hickory Corners, Michigan. 22 October 2004.
24. Jastrow, J.D. Aggregate protection and the storage of carbon in grassland soils: Dynamics and mechanisms. 11th Annual Kling Anderson Range Science Lecture, Department of Agronomy, Kansas State University, Manhattan, Kansas. 24 April 2002.
25. Jastrow, J.D. Prairie restoration below ground: Rebuilding soil structure and organic matter. Department of Geography Spring Colloquium Series, Northern Illinois University, DeKalb, Illinois. 22 February 2002.
26. Jastrow, J.D. Prairie restoration below ground: Rebuilding soil structure and organic matter. The Morton Arboretum Winter Research Seminar Series "Look Out Below!", Lisle, Illinois. 21 February 2002.
27. Miller, R.M., and J.D. Jastrow. Arbuscular mycorrhizal fungi influence soil structure. Third International Conference on Mycorrhizas, Diversity and Integration in Mycorrhizas, Adelaide Convention Centre, Adelaide, Australia. 12 July 2001.
28. Jastrow, J.D. Reducing atmospheric carbon dioxide through terrestrial sequestration. Eco-Informa 2001: Environmental Risks and the Global Community, Strategies for Meeting the Challenges, Argonne National Laboratory, Argonne, Illinois. 16 May 2001.
29. Jastrow, J.D. Accrual of soil organic carbon following restoration of perennial grassland on previously cultivated soils. Symposium on The Science of Carbon Sequestration. 2000 Fall Meeting of the American Geophysical Union, San Francisco, California. 18 December 2000.
30. Jastrow, J.D., and R.M. Miller. Soil aggregation in the rhizosphere: Optimal conditions for multiple mechanisms. Symposium on the Rhizosphere: Top-Down and Bottom-Up Approaches. The Ecological Society of America 85th Annual Meeting, Snowbird, Utah. 8 August 2000.
31. Miller, R.M., and J.D. Jastrow. Mycorrhizal fungi contribute to soil aggregation. Mycorrhizas 2000, Quebec Mycorrhiza Group, Rivière-du-Loup, Quebec. 1-3 June 2000.
32. Jastrow, J.D. Carbon and nitrogen accrual in prairie soil organic matter fractions under elevated atmospheric CO<sub>2</sub>. GCTE/COST Workshop on Litter Quality and Decomposition Under Elevated Atmospheric CO<sub>2</sub>, Capri, Italy. 26 September 1998.
33. Jastrow, J.D. Soil aggregation processes in arid ecosystems. Keynote Presentation, International Workshop on Soil Aggregation in Arid Lands: Processes, Measurement, and Application, USDA/ARS Jornada Experimental Range, Las Cruces, New Mexico. 8 May 1997.
34. Jastrow, J.D. Mycorrhizae and the restoration of soil structure. The Role of Mycorrhizal Fungi in Restoration Ecology, The First Janet Meakin Poor Research Symposium, Chicago Botanic Garden, Glencoe, Illinois. 22 October 1996.
35. Jastrow, J.D. Contributions of mycorrhizae to the development of soil aggregate hierarchy. First International Conference on Mycorrhizae, University of California, Berkeley, California. 5 August 1996.
36. Jastrow, J.D., and R.M. Miller. Soil aggregate stabilization and carbon sequestration: Feedbacks through organo-mineral associations. International Symposium on Carbon Sequestration in Soil, The Ohio State University, Columbus, Ohio. 23 July 1996.
37. Jastrow, J.D. The dynamics and functioning of mycorrhizae in restored tallgrass prairie. Departments of Forestry, Plant Biology, and Ecology, Ethology, and Evolution Joint Seminar, University of Illinois, Urbana-Champaign, Illinois. 19 October 1994.
38. Jastrow, J.D. Control mechanisms of carbon turnover and accrual in soils. Environmental Research Division Seminar, Argonne National Laboratory, Argonne, Illinois. 19 April 1994.

39. Jastrow, J.D. Soil biotic activity, soil structure, and carbon storage: What's going on down there? Ecology and Evolution Seminar Series, Department of Biological Sciences, University of Illinois at Chicago, Illinois. 5 April 1994.
40. Jastrow, J.D. Prairie restoration and potential research opportunities. Pi Alpha Xi Awards Banquet, Department of Horticulture, Purdue University, West Lafayette, Indiana. 22 March 1994.
41. Jastrow, J.D. Methods for characterizing vegetation and soil structure. Junior High School Teacher's Science and Math Summer Institute, Division of Educational Programs, Argonne National Laboratory, Argonne, Illinois. 20-21 July 1992.
42. Miller, R.M., and J.D. Jastrow. The role of mycorrhizae in soil conservation. 55th Annual Meeting of the Soil Science Society of America, Denver, Colorado. 31 October 1991.
43. Jastrow, J.D. Biological influences on soil structure. Ecology and Evolution Seminar Series, Department of Biological Sciences, University of Illinois at Chicago, Illinois. 14 May 1991.
44. Jastrow, J.D. Prairie soils and fungi. Teacher's Working Group for Curriculum Development, Fermilab Particles and Prairies Project, Fermilab, Batavia, Illinois, Sponsored by the Chicago Science Explorers Program. 13 April 1991.
45. Jastrow, J.D. There's more to prairie restoration than meets the eye: Take a look belowground! Tenth Northern Illinois Prairie Workshop, Northern Illinois University, DeKalb, Illinois. 2 March 1991.
46. Jastrow, J.D., and R.M. Miller. Interrelationships between root morphology and va mycorrhizal fungi in temperate grassland communities. Eighth North American Conference on Mycorrhizae, University of Wyoming, Jackson, Wyoming. 8 September 1990.
47. Miller, R.M., and J.D. Jastrow. The role of the extraradical hyphal phase of mycorrhizal fungi to sustainable ecosystems. Eighth North American Conference on Mycorrhizae, University of Wyoming, Jackson, Wyoming. 8 September 1990.
48. Jastrow, J.D. Prairie soils. Science and Technology for the Nineties, Argonne Community of Teachers Workshop, Argonne National Laboratory, Argonne, Illinois. 26 April 1990.
49. Jastrow, J.D. Biological influences on soil structure. Seminar at Savannah River Ecology Laboratory, Aiken, South Carolina. 22 March 1990.
50. Jastrow, J.D., and R.M. Miller. Biological influences on soil structure. DOE/OHER Program Director's Meeting, Argonne National Laboratory, Argonne, Illinois. 9 November 1989.
51. Miller, R.M., and J.D. Jastrow. The effects of biota on soil structure. International Workshop on Modern Techniques in Soil Ecology, University of Georgia, Athens, Georgia. 13 September 1989.
52. Jastrow, J.D. Biological influences on soil aggregation in a chronosequence of restored tallgrass prairie. Ecology and Evolution Seminar Series, Department of Biological Sciences, University of Illinois at Chicago, Illinois. 17 January 1989.
53. Jastrow, J.D. Biological influences on soil structure in restored tallgrass prairie. Biological Sciences Department Seminar, Illinois State University, Normal, Illinois. 8 December 1988.
54. Jastrow, J.D. DOE-funded reclamation research (1975-1981). Reclamation Technology Committee Seminar, American Mining Congress, Washington, DC. 4 February 1986.
55. Jastrow, J.D. Revegetation of acidic coal mine refuse. 13th Argonne Universities Association Biology Symposium: Biological Aspects of Ecosystem Restoration, Argonne, Illinois. 22 April 1980.